JC10 Rec'd PCT/PTO 26 FEB 2002

BAKER BOTTS LLP

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35.U.S.C. 371

EXPRESS MAIL LABEL No	DATE
EU206385857US	26 FEBRUARY 2002

ATTORNEY'S DOCKET NO: A35040 PCT USA

US APPLICATION NO: 10/069653

INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/02905	25 AUGUST 200	26 AUGUST 1999

TITLE OF INVENTION: LUTE

APPLICANT(S) FOR DO/EO/US: Andre Burguete, Benno Streu, Gunter Mark

Applicant herewith submits to the United States Designated /Elected Office (DO/EO/US) the following items and other information:

1. [✓] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. [✓] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).
4. [ ] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [✓] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [✓] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [ ] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [✓] A copy of the International Search Report (PCT/ISA/210)
   a. [✓] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. [✓] A copy of the International Preliminary Examination Report (PCT/IPEA/409)
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [ ] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [✓] Other items or information:
    a. [✓] a copy of the International Search Report (PCT/ISA/210)
    b. [✓] a copy of the International Preliminary Examination Report (PCT/IPEA/409)

JC19 Rec'd PCT/PTO 26 FEB 2002

INTERNATIONAL APPLICATION NO. PCT/DE00/02905 10/069653	INTERNATIONAL FILING DATE 25 AUGUST 200	PRIORITY DATE CLAIMED 26 AUGUST 1999

17. [ ] The following fees are submitted:

CALCULATIONS PTO USE ONLY

Basic National Fee (37 CFR 1.492(a)(1)-(5):

Neither international preliminary examination fee (37 CFR 1.482)

Nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO (1.492(a)(3)) $1,040

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO (1.492(a)(5) $890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO(1.492(a)(2)) $740.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) (1.492(a)(1)) $710.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $ 100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =				$ 890	
Surcharge of $130.00 for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).				$	
Claims	**Number Filed**	**Number Extra**	**Rate**	$	
Total Claims	-20=	0	X $ 18.00	$ 0	
Independent Claims	-3=	0	X $ 84.00	$ 0	
Multiple dependent claim(s) (if applicable)			+ $280.00	$	
TOTAL OF ABOVE CALCULATIONS =				$ 890	
Reduction by ½ for filing by small entity, if applicable.				$ 445	
SUBTOTAL =				$ 445	
Processing fee of $130.00 for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
TOTAL NATIONAL FEE =				$ 445	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +				$	
TOTAL FEES ENCLOSED =				$ 445	
				Amt. refunded	$
				charged	$

a. [✓] A check in the amount of $ 445 to cover the above fees is enclosed.

b. [ ] Please charge our Deposit Account No. 02-4377 in amount of $_____ to cover the above fees. A copy of this sheet is enclosed.

c. [✓] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4377. A copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:
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Attorney: James J. Maune PTO Reg: 26,946

26 FEBRUARY 2002
Date

FILE NO.A35040-PCT-USA-066340.0143
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Burguete et al.

Serial No. : 10/069,653

Filed : February 26, 2002

For : LUTE

PRELIMINARY AMENDMENT AND RESPONSE TO NOTICIFICATION OF MISSING REQUIREMENT UNDER 35 U.S.C. 371

I hereby certify that this paper is being deposited with the United States Postal Service in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

July 12, 2002
Date of Deposit

James J. Maune
Attorney Name

26,946
PTO Registration No

Signature

July 12, 2002
Date of Signature

EXPRESS MAIL LABEL NO. ET346776880US

Assistant Commissioner for Patents

Washington, D.C. 20231

Sir:

In response to the Notice to File Missing Parts, Applicants submit herewith a translation of the application as filed. Also submitted is a translation of the Preliminary Examination Report.

Please amend the Application as follows:

IN THE SPECIFICATION:

Please substitute the attached Substitute Specification and Abstract for the translation of this application. The Substitute Specification conforms to U.S. Practice and places the application in better English. The Substitute Specification also make reference to the amended drawings.

IN THE DRAWINGS:

With the consent of the Primary Examiner it is requested that Fig. 3 of the application be amended as illustrated in red on the attached copy thereof and that Figure 4 be added to the application. These changes are made to comply with 37 C.F.R. § 1.83(a). No new matter is added.

IN THE CLAIMS:

Cancel Claims 1 to 14.

Add claims 15 to 28 as follows:

15. A lute comprising a neck, a bulging sound box tapering down to a virtual point and attached to said neck at said virtual point, a peg box at an end of said neck remote from said sound box, and strings stretched between said peg box and an end piece, said sound box including a vaulted back having a planar rim that is curved outwardly from one side of said neck in a continuous curve to the other side of said neck and a face having a longitudinal centerline and connected to said rim of said back, said face including transverse ribs on an inside surface and said end piece mounted on an outside surface in a longitudinal portion thereof corresponding to the longitudinal third of said face remote from said neck, said face having at least one aperture

between said inside and outside surfaces in a longitudinal half thereof nearest said neck, wherein at least a portion of said face, including said end piece, is vaulted outward from said planar rim by at least 2 mm., and wherein said face includes an area at a longitudinal end thereof remote from said neck which has a longitudinal length of approximately twice a longitudinal distance between said end piece and said remote longitudinal end of said face and which area is devoid of transverse ribs.

16. A lute as specified in claim 15 wherein said area of said face includes laths extending in a generally longitudinal direction and arranged symmetrically about said longitudinal centerline.

17. A lute according to claim 16 wherein said laths are arranged at acute angles with respect to said centerline.

18. A lute according to claim 16 wherein the laths are in a fan configuration having central axes intersect at an imaginary point on said centerline of the face.

19. A lute according to claim 16 wherein the laths run parallel to said centerline.

20. A lute according to claim 16 wherein an even number of laths is provided.

21. A lute according to claim 16 wherein an odd number of laths is provided.

22. A lute according to claim 15 wherein said face has a thickness which diminishes toward said rim at least in area devoid of transverse ribs.

23. A lute according to claim 15 wherein said transverse ribs have ends which rest on abutments.

24. A lute according to claim 16 wherein at least two of said laths extend below at least one transverse rib which lies closest to the rib-free area, wherein said at least one transverse rib comprises a tunnel-shaped recess through which said laths pass without contact between said laths and said transverse ribs.

25. A lute according to claim 16 wherein said neck includes a fingerboard having frets and wherein said fingerboard and said frets extend onto a segment of said.

26. A lute according to claim 25 wherein said face is reinforced on its inside with a piece of hardwood in the region of said face segment.

27. A lute according to calim 15 wherein eight strings (17) are strung, said strings being tuned C - D - E - A - d - g - h - e'.

28. A lute according to claim 15 wherein fifteen single strings are strung, said strings being tuned G - A - B - C - D - E - F - G - A - B - d - f - a -d' - f', or G - A - B - C - D - E - F - G - A - B - d - f - a - d' - g'.

REMARKS

Applicants submit herewith a translation of the application as filed and a proposed Substitute Specification, Drawing amendment and Abstract in compliance with U.S. Practice.

Claims 1 to 14 are cancelled. Claims 15 to 28 conforming to U.S. practice are presented.

A Declaration and Power of Attorney are submitted herewith.

Respectfully submitted,

James J. Maune
PTO Reg. No. 26,946
Attorney for Applicant
(212) 408-2566

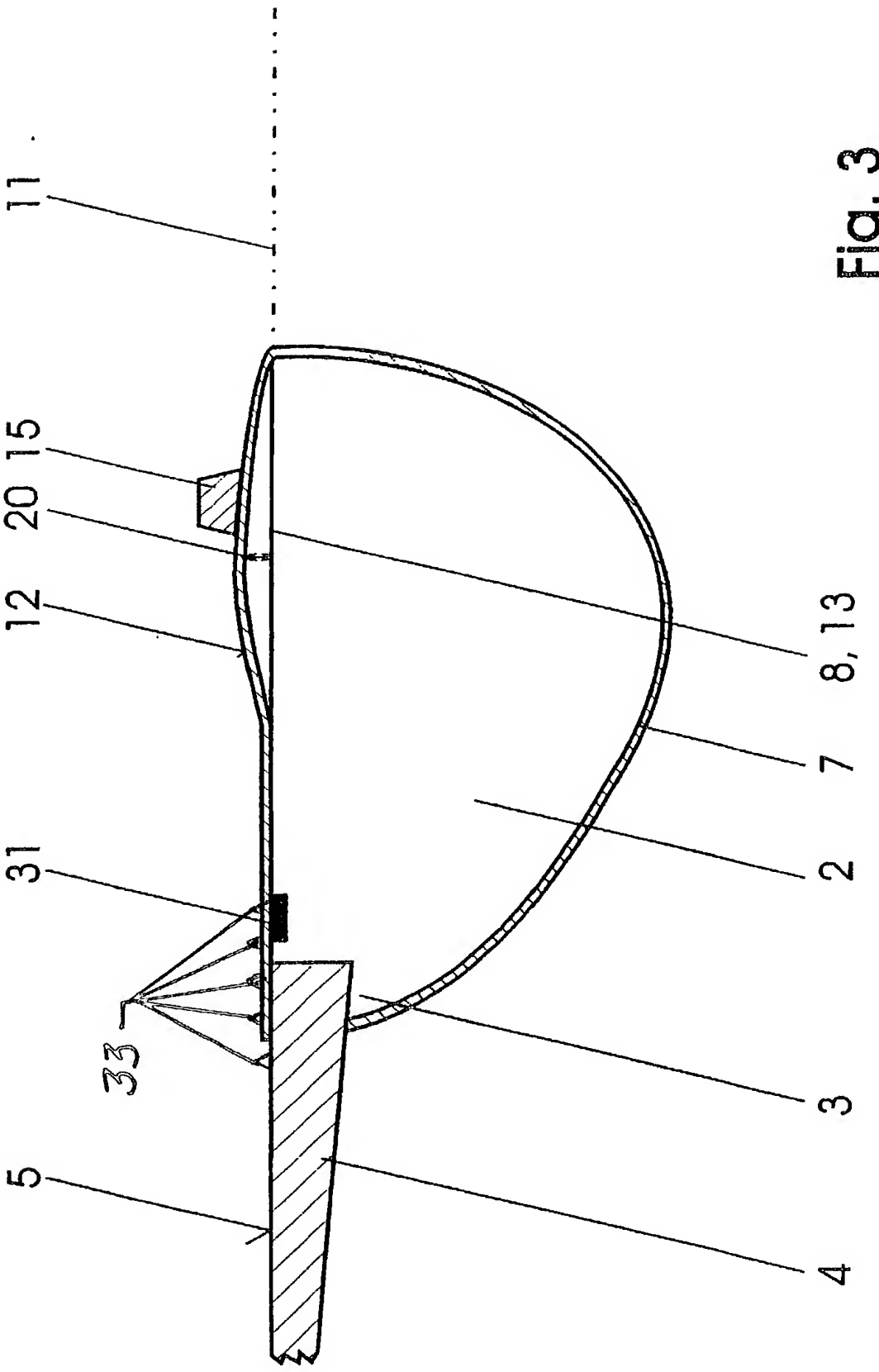

Fig. 3

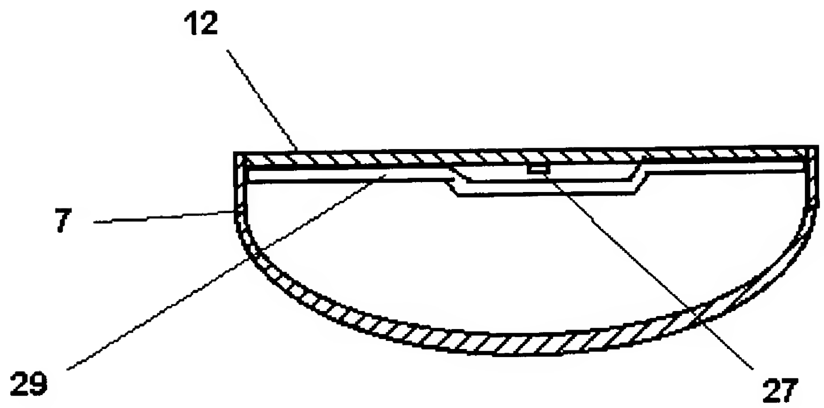

Fig. 4

SUBSTITUTE SPECIFICATION

Lute

BACKGROUND OF THE INVENTION

[0001] The invention relates to a lute having a bulging sound box tapering to a virtual point and a neck attached to the so-called stock or upper block to one side of the point. The neck comprises a fingerboard furnished with frets. At its free end, the neck bears a peg box. The sound box consists of the vaulted back of the lute, its rim always curved outward from one side of the neck to the other and lying in a plane. The sound box comprises a face whose edge is connected to the rim of the back. The face, on its under side towards the back of the lute, is provided with spreaders or fan beams, hereinafter referred to as laths, and transverse ribs. On its top, opposed to the under side, the face is furnished with a tailpiece, connected to the third of the face centerline farthest removed from the neck and in its lengthwise extent transverse to the centerline. Between the peg box and the tailpiece, a plurality of strings are stretched. In the half of the centerline near the neck, in the region of the strings, one or more apertures are made between the upper and under side of the face.

[0002] In Claus Martius, *Leopold Widhalm und der Nürnberger Lauten- und Geigenbau im 18. Jh.*, a publication of the Institute for Synthetics Technology and Conservation in the Germanic National Museum, vol. 4, Verlag Erwin Bochinski 1996, we have the latest stage of development of the lute in the 18th Century. A lute, then, has a bulging sound box tapering down to a virtual

point, where a neck is attached. As part of the generally known prior art, the neck comprises a fingerboard furnished with frets and bearing a peg box at its free end.

[0003] Concerning the lute dating from the 18th Century, it is known further that the sound box consists of the vaulted back of the lute, its rim always curved outwardly from one side of the neck to the other. The edge of the back lies in a plane. The back of the lute is covered with a face whose edge is connected to the rim of the back.

[0004] The face, like almost all parts of the lute, is made of wood. The direction of the grain of the face is parallel to its centerline. This means that new and old wood in the face form nearly straight stripes, substantially parallel to the centerline of the face.

[0005] The familiar lute is provided with seven transverse ribs, lying transverse to the centerline and hence in particular transverse to the grain of the wood of the face. Thus, the preponderant area of the under side of the face is provided with transverse ribs. In about a quarter of the area of the under side of the face away from the neck there are provided fan ribs. The axis of these fan ribs have -- if any -- a common point of intersection, located in the third of the centerline of the face furthest removed from the neck.

[0006] Specifically, an approximately common point of intersection lies in the neighborhood of a tailpiece arranged on the top of the face. In fact, this tailpiece is located in the third of the face centerline farthest removed from the neck. It is connected to the face on this centerline and in its lengthwise extent transverse to the centerline. Between the peg box and the tailpiece, several strings are stretched. The classic stringing consists of 13 strings tuned A - B - C - D - E - F - G - A - d - f - a - d' - f'. The first ten of these strings are double. Only the d' and f' strings are single.

[0007] From José L. Romanillos, *Antonio de Torres, Ein Gitarrenbauer - Sein Leben und Werk*, Verlag Erwin Bochinski, we learn of Antonio de Torres' construction of about 1850, still used for concert guitars today. Such a guitar comprises a face and a back, connected to each other by a frame. The frame has a pronounced waist, so that both face and back follow this conformation. In the neighborhood of the waist, a transverse rib is arranged. In addition to two more transverse ribs in the part of the face near the neck, this known guitar is also provided with two oblique laths in the part distant from the neck. Between these oblique laths and the ribs in the waist area of the guitar, additional laths or so-called fan ribs are arranged, the parts designated as laths occupying only about 1/10 of the cross-sectional area of the parts referred to as ribs. About in the middle between waist and far end of the guitar, the end piece is attached to the top of the face. Between the end piece and the peg box located at its free end, six strings tuned E - A - d - g - h - e' are stretched.

[0008] The present-day guitar, developed in Spain in the middle of the 19th Century, is undoubtedly one of the most popular musical instruments of the age.

[0009] Nevertheless, for European music it represents only a stand-in for the lute.

[0010] Since the 15th Century, the lute has become one of the most important tonal implements of western musical literature. Many famed composers left works behind that had been written for the lute. But these works today can hardly or only inadequately be rendered on the guitar acting as stand-in, for which reason they have largely lapsed into oblivion.

[0011] The reason for the displacement of the lute from today's orchestras is to be found in that nearly all orchestral instruments have accomplished a definite development in the past few

centuries, while the lute has not. As a result, the lute lacks volume, it is very complicated to play, has limited expressiveness and an antiquated notation.

[0012] In printed source US 1,361,182, a stringed instrument is described that comprises a body having a substantially closed frame around an upper and an under side. However, the upper and under sides are each convexly vaulted. This instrument has no transverse ribs or laths, and the body departs from the typical lute shape, so that this instrument will yield a sound differing distinctly from that of the lute.

[0013] German Utility Design G 88 08 073.0 describes an instrument representing the structure of a guitar as described above.

[0014] The object of this invention, then, is to lend the lute a conformation such that it will meet modern concert conditions and become accessible, while retaining its outstanding tonal properties, to present-day guitarists, thus making possible a reintegration of the lute into the orchestral apparatus of today.

SUMMARY OF THE INVENTION

[0015] According to the invention, the face of the lute, including the end piece, is vaulted outward, the greatest distance of the vaulted face above the plane being at least 2 mm. In addition, on the underside of the face, a space clear of transverse ribs is provided, corresponding to a first segment, between the end piece and the part of the rim away from the neck, and a second segment adjacent to the first and of about the same size between the mutually opposed rims. Thus, the area free from transverse ribs is either at the same time a lath-free area, or provided with laths arranged in central symmetry. By virtue of the face curvature, the lute is

endowed with a stability dispensing with any heavy stiffening of the face. It thus becomes possible to set this face area in vibration more readily, improving the access of sound to the instrument.

[0016] Ideally, the area on the under side of the face located below the end piece should have little if any lathing, to avoid impeding acoustic access or propagation.

[0017] In a favorable embodiment of the invention, provision is made so that the lathing, if present, consists of laths running substantially parallel to the centerline.

[0018] The laths may run at an acute angle to the direction of the centerline. What is meant here by the run of the laths is that their centerlines make at most an angle of less than 45° with the centerline.

[0019] In a possible embodiment of the invention, provision is made for the laths to run fan-shaped in such manner that their mid-length axes intersect at an imaginary point on the centerline of the face or its prolongation towards the neck.

[0020] Alternatively, it is also possible that the laths may run parallel to the centerline.

[0021] In another embodiment of the invention, an even number of laths is provided. The effect of this is to leave the centerline unlathed.

[0022] In another embodiment of the invention, an odd number of laths is provided.

[0023] Since the laths are in principle arranged symmetrically to the centerline of the face, an odd number of laths will ensure that the centerline itself is always lathed.

[redacted]

[0024] As odd numbers, the numbers three, five, seven and nine are especially suitable numbers of laths.

[0025] In an advantageous embodiment of the invention, provision is made for the thickness of the face, at least in the region of the area free from transverse ribs, to diminish towards the edge. This will achieve a higher fundamental component of bass sounds.

[0026] In principle, such a lathing will make possible a more uniform transmission of sound from the end piece to the face.

[0027] In still another embodiment of the invention, provision is made for the ends of the transverse ribs to rest on abutments.

[0028] The invention may also be further developed in that at least two laths run under, without contact, at least that transverse rib which lies closest to the unribbed area. This is accomplished in that the rib comprises a tunnel-shaped recess at the intersection between rib and lath. This avoids contact between lath and rib, and affords passage of sound by way of the laths also into that part of the area which is provided with ribs.

[0029] In still another embodiment of the invention, provision is made for the fingerboard to be prolonged by a face segment on the face. On this segment, the arrangement of the frets is continued. Owing to this arrangement, it is possible for the higher strings to be playable with higher tones as well.

[0030] In this embodiment, it is expedient to reinforce the face in the neighborhood of the face segment with a piece of hardwood on its under side. For in the first place, this enhances the mechanical stability of the face in this area, which is expedient, since playing of the strings will

exert a not inconsiderable pressure on this part of the face. In the second place, it also strengthens the acoustic access of the strings by way of the face, since just when the higher strings are played with higher tone, the oscillatory bulk of the strings and hence their volume is very low, especially if the face is yielding in this segment.

[0031] In yet another embodiment of the invention, provision is made for eight strings to be stretched on the lute, with tuning C - D - E - A - d - g - h - e'. With such a stringing, it becomes possible to play all guitar music since 1800, as well as modern music. If in addition, the g-string is tuned down a half-step to fis, it becomes possible also to play all the lute music from 1450 to 1630.

[0032] Alternatively to this stringing, it is possible to string the lute with fifteen single strings, tuned G - A - B - C - D - E - F - G - A - B - d - f - a - d' - f', or else

G - A - B - C - D - E - F - G - A - B - d - f - a - d' - g'. Such a stringing yields the possibility of playing the entire lute music in the period between 1630 and 1800, parts of the guitar repertory, music of the 19th and 20th Centuries, parts of the lute music repertoires from 1450 to 1630, as well as present-day compositions.

[0033] The invention will now be illustrated in more detail in terms of an embodiment by way of example.

DESCRIPTION OF THE DRAWINGS

[0034] Fig. 1 shows a side view of a lute according to an embodiment ofthe invention,

[0035] Fig. 2 shows a top view of the under side of the face of the lute according to an embodiment of the invention,

[0036] Fig. 3 shows a longitudinal section of the lute according to an embodiment of the invention.

DESCRIPTION OF THE INVENTION

[0037] As shown in the drawings, the lute 1 comprises a bulging sound box 2. This is shaped so that it tapers down to a virtual tip 3. At the tip 3, a neck 4 is attached. This neck 4 comprises a fingerboard 5, provided with frets not explicitly shown. At its free end, the neck 4 bears a peg box 6.

[0038] The sound box 2 itself consists of a vaulted lute back 7. The rim 8 of the back 7 is always curved outward from one side 9 of the neck 4 and the other side 10. Also, the rim 9 lies on a plane, indicated by reference numeral 11 in Fig. 3. Further, the sound box 2 consists of a face 12 whose edge 13 is connected to the rim 8 of the back 7.

[0039] On its top 14, the face 12 is provided with an end piece 15. The end piece 15 is arranged on a centerline 16 of the face 12, to wit, in its lengthwise extent transverse to the centerline 16. In this position, the end piece 15 is connected to the face 12, for example by means of a bonded connection.

[0040] Between the peg box 6 and the end piece 15, several strings 17 are stretched. On the neck half of the centerline 16, in the region of the strings 17, an aperture 18 is made in the face 12, closed with a rose 19 in such manner as to form numerous small openings.

[0041] As may be seen especially in Fig. 3, the face 12 including the endpiece 15 is vaulted over a camber 20. This camber, in the embodiment of this example, amounts to 2 mm or more.

[0042] On the under side of the face 12, an area 21 free from transverse ribs is provided. This ribless area 21 consists of first part 2 and a second part 23. The first part extends between the end piece 15 and the end 24 of the rim 13 away from the neck. The second part 23 borders on the first part 22 and is about the same centerline length as the first part 22. The second part extends between mutually opposed edge portions 25 and 26.

[0043] On the area 21 free from ribs, laths 27 are arranged with central symmetry. Their mid-length axes 28 intersect at an imaginary point on the prolongation of the centerline 16 towards the neck 4.

[0044] All told, seven laths 27 are provided in the illustrated embodiment, by way of example. However, an even number of laths 27 is also possible. In the remaining area of the under side of the face, five transverse ribs 29 are arranged. The rose 19 is secured against being pushed in by small safety ribs 30.

[0045] The fingerboard 5 is prolonged by a face segment on the face 12. The face segment is fretted. As may be seen in Fig. 2 and Fig. 3, the face 12 is reinforced under the face segment on its under side with a piece of hardwood 31.

[0046] While there have been described what are believed to be the preferred embodiments of the invention those skilled in the art will recognize that other changes and modifications may be made thereto without departing from the spirit of the invention, and it is intended to claim all such changes and modifications as fall within the true scope of the invention.

[Translation from the German]

Lute

The invention relates to a lute having a bulging sound box tapering to a virtual point and a neck attached to the so-called stock or upper block to one side of the point. The neck comprises a fingerboard furnished with frets. At its free end, the neck bears a peg box. The sound box consists of the vaulted back of the lute, its rim always curved outward on the way from one side of the neck to the other and lying in a plane. Besides, the sound box comprises a face whose edge is connected to the rim of the back. The face, on its under side towards the back of the lute, is provided with spreaders or fan beams, hereinafter referred to as laths, and transverse ribs. On its top, opposed to the under side, the face is furnished with a tailpiece, connected to the third of the face centerline farthest removed from the neck and in its lengthwise extent transverse to the centerline. Between the peg box and the tailpiece, a plurality of strings is stretched. In the half of the centerline near the neck, in the region of the strings, one or more apertures are made between the upper and under side of the face.

In Claus Martius, *Leopold Widhalm und der Nürnberger Lauten- und Geigenbau im 18. Jh.*, a publication of the Institute for Synthetics Technology and Conservation in the Germanic National Museum, vol. 4, Verlag Erwin Bochinski 1996, we have the latest stage of development of the lute in the 18th Century. A lute, then, has a bulging sound box tapering down to a virtual point, where a neck is attached. As part of the generally

known prior art, the neck comprises a fingerboard furnished with frets and bearing a peg box at its free end.

Concerning the lute dating from the 18th Century, it is known further that the sound box consists of the vaulted back of the lute, its rim always curved outward on the way from one side of the neck to the other. The edge of the back lies in a plane. The back of the lute is covered with a face whose edge is connected to the rim of the back.

The face, like almost all parts of the lute, is made of wood. The direction of the grain of the face is parallel to its centerline. This means that new and old wood in the face form nearly straight stripes, substantially parallel to the centerline of the face.

The familiar lute is provided with seven transverse ribs, lying transverse to the centerline and hence in particular transverse to the grain of the wood of the face. Thus, the preponderant area of the under side of the face is provided with transverse ribs. Only in about the quarter of the area of the under side away from the neck are fan ribs arranged. The centerlines of these fan ribs have -- if any -- a common point of intersection, located in the third of the centerline of the face away from the neck.

Specifically, an approximately common point of intersection lies in the neighborhood of a tailpiece arranged on the top of the face. In fact, this tailpiece is located in the third of the face centerline farthest removed from the neck. It is connected to the face on this centerline and in its lengthwise extent transverse to the centerline. Between the peg box and the tailpiece, several strings are stretched. The classic stringing consists of 13 strings tuned A - B - C - D - E - F - G - A - d - f - a - d' - f'. The first ten of these strings are double. Only the d' and f' strings are single.

From José L. Romanillos, *Antonio de Torres, Ein Gitarrenbauer - Sein Leben und Werk*, Verlag Erwin Bochinski, we learn of Antonio de Torres' construction of about

1850, still used for concert guitars today. Such a guitar comprises a face and a back, connected to each other by a frame. The frame has a pronounced waist, so that both face and back follow this conformation. In the neighborhood of the waist, a transverse rib is arranged. In addition to two more transverse ribs in the part of the face near the neck, this known guitar is also provided with two oblique laths in the part distant from the neck. Between these oblique laths and the ribs in the waist area of the guitar, additional laths or so-called fan ribs are arranged, the parts designated as laths occupying only about 1/10 of the cross-sectional area of the parts referred to as ribs. About in the middle between waist and far end of the guitar, the end piece is attached to the top of the face. Between the end piece and the peg box located at its free end, six strings tuned E - A - d - g - h - e' are stretched.

The present-day guitar, developed in Spain in the middle of the 19th Century, is undoubtedly one of the most popular musical instruments of the age.

Nevertheless, for European music it represents only a stand-in for the lute.

Since the 15th Century, the lute has become one of the most important tonal implements of western musical literature. Many famed composers left works behind that had been written for the lute. But these works today can hardly or only inadequately be rendered on the guitar acting as stand-in, for which reason they have largely lapsed into oblivion.

The reason for the displacement of the lute from today's orchestras is to be found in that nearly all orchestral instruments have accomplished a definite development in the past few centuries, while the lute has not. As a result, the lute lacks volume, it is very complicated to play, has limited expressiveness and an antiquated notation.

In printed source US 1,361,182, a stringed instrument is described that comprises a body having a substantially closed frame around an upper and an under side. However, the upper and under sides are each convexly vaulted. This instrument has no transverse ribs or laths, and the body departs from the typical lute shape, so that this instrument will yield a sound differing distinctly from that of the lute.

German Utility Design G 88 08 073.0 describes an instrument representing the structure of a guitar as described above.

The object of this invention, then, is to lend the lute a conformation such that it will meet modern concert conditions and become accessible, while retaining its outstanding tonal properties, to present-day guitarists, thus making possible a reintegration of the lute into the orchestral apparatus of today.

According to the invention, this object is accomplished in that the face of the lute, including the end piece [reading *Saitenhalter* for *Lautenhalter*], is vaulted outward, the greatest distance of the vaulted face above the plane being at least 2 mm. Besides, on the under side of the face, a space clear of transverse ribs is provided, corresponding to a first segment, say between the end piece and the part of the rim away from the neck, and a second segment adjacent to the first and of about the same size between the mutually opposed rim segment. Thus, the area free from transverse ribs is either at the same time a lath-free area, or provided with laths arranged in central symmetry. By virtue of the face curvature, the lute is endowed with a stability dispensing with any heavy stiffening of the face. It thus becomes possible to set this face area in vibration more readily, improving the access of sound to the instrument.

Ideally, the area on the under side of the face located below the end piece should have little if any lathing, yet not impeding acoustic access or propagation.

In a favorable embodiment of the invention, provision is made so that the lathing, if present, consists of laths running substantially in the direction of lengthwise extent of the centerline.

It may be so configured that the laths run at an acute angle to the direction of the lengthwise extent of the centerline. What is meant here by the run of the laths is that their mid-length lines make at most an angle of less than 45° with the centerline.

In a possible embodiment of the invention, provision is made for the laths to run fan-shaped in such manner that their mid-length axes intersect at an imaginary point on the centerline of the face or its prolongation towards the neck.

Alternatively, it is also possible that the laths may run parallel to the centerline.

In another embodiment of the invention, an even number of laths is provided. The effect of this is to leave the centerline unlathed.

In another embodiment of the invention, an odd number of laths is provided.

Since the laths are in principle arranged symmetrically to the centerline of the face, an odd number of laths will ensure that the centerline itself is always lathed.

As odd numbers, the numbers three, five, seven and nine are especially suitable numbers of laths.

In an advantageous embodiment of the invention, provision is made for the thickness of the face, at least in the region of the area free from transverse ribs, to diminish towards the edge. This will achieve a higher fundamental component of bass sounds.

In principle, such a lathing will make possible a more uniform transmission of sound from the end piece to the face.

In still another embodiment of the invention, provision is made for the ends of the transverse ribs to rest on abutments (brackets).

The invention may also be further developed in that at least two laths run under, without contact, at least that transverse rib which lies closest to the unribbed area. This is accomplished in that the rib comprises a tunnel-shaped recess at the intersection between rib and lath. This avoids contact between lath and rib, and affords passage of sound by way of the laths also into that part of the area which is provided with ribs.

In still another embodiment of the invention, provision is made for the fingerboard to be prolonged by a face segment on the face. On this segment, the arrangement of the frets is continued. Owing to this arrangement, it is possible for the higher strings to be playable with higher tones as well.

In this embodiment, it is expedient to reinforce the face in the neighborhood of the face segment with a piece of hardwood on its under side. For in the first place, this enhances the mechanical stability of the face in this area, which is expedient, since playing of the strings will exert a not inconsiderable pressure on this part of the face. In the second place, it also strengthens the acoustic access of the strings by way of the face, since just when the higher strings are played with higher tone, the oscillatory bulk of the strings and hence their volume is very low, especially if the face is yielding in this segment.

In yet another embodiment of the invention, provision is made for eight strings to be stretched on the lute, with tuning C - D - E - A - d - g - h - e'. With such a stringing, it becomes possible to play all guitar music since 1800, as well as modern music. If in addition, the g-string is tuned down a half-step to fis, it becomes possible also to play all the lute music from 1450 to 1630.

Alternatively to this stringing, it is possible to string the lute with fifteen single strings, tuned G - A - B - C - D - E - F - G - A - B - d - f - a - d' - f', or else G - A - B - C - D - E - F - G - A - B - d - f - a - d' - g'. Such a stringing yields the possibility of playing the entire lute music in the period between 1630 and 1800, parts of the guitar repertory, music of the 19th and 20th Centuries, parts of the lute music repertoires from 1450 to 1630, as well as present-day compositions.

The invention will now be illustrated in more detail in terms of an embodiment by way of example. In the accompanying drawings,

Fig. 1 shows a side view of a lute according to the invention,

Fig. 2 shows a top view of the under side of the face of the lute according to the invention, and

Fig. 3 shows a longitudinal section of the lute according to the invention.

As shown in the drawings, the lute 1 comprises a bulging sound box 2. This is so shaped that it tapers down to a virtual tip 3. At the tip 3, a neck 4 is attached. This neck 4 comprises a fingerboard 5, provided with frets not explicitly shown. At its free end, the neck 4 bears a peg box 6.

The sound box 2 itself consists of a vaulted lute back 7. The rim 8 of the back 7 is always curved outward on the way from one side 9 of the neck 4 and its other side 10. Also, the rim 9 lies on a plane, indicated by reference numeral 11 in Fig. 3. Further, the sound box 2 consists of a face 12 whose edge 13 is connected to the rim 8 of the back 7.

On its top 14, the face 12 is provided with an end piece 15. The end piece 15 is arranged on a centerline 16 of the face 12, to wit, in its lengthwise extent transverse

to the centerline 16. In this position, the end piece 15 is connected to the face 12, for example by means of a bonded connection.

Between the peg box 6 and the end piece 15, several strings 17 are stretched. On the neck half of the centerline 16, in the region of the strings 17, an aperture 18 is made in the face 12, closed with a rose 19 in such manner as to form numerous small openings.

As may be seen especially in Fig. 3, the face 12 including the endpiece 15 is vaulted over a so-called camber 20. This camber, in the embodiment of this example, amounts to 2 mm or more.

On the under side of the face 12, an area 21 free from transverse ribs is provided. This ribless area 21 consists of first part 22 and a second part 23. The first part extends between the end piece 15 and the portion 24 of the rim 13 away from the neck. The second part 23 borders on the first part 22 and is about the same size as the first part 22. The second part extends between mutually opposed edge portions 25 and 26.

On the area 21 free from ribs, laths 27 are arranged with central symmetry. Their mid-length axes 28 intersect at an imaginary point on the prolongation of the centerline 16 towards the neck 4.

All told, seven laths 27 are provided in the embodiment by way of example. However, an odd number of laths 27 is also possible. In the remaining area of the under side of the face, five transverse ribs 29 are arranged. The rose 19 is secured against being pushed in by small safety ribs 30.

In manner not shown in detail, the fingerboard 5 is prolonged by a face segment on the face 12. The face segment is fretted. As may be seen in Fig. 3, the face 12 is reinforced under the face segment on its under side with a piece of hardwood 31.

List of Reference Numerals

1	lute
2	sound box
3	tip
4	neck
5	fingerboard
6	peg box
7	back
8	rim
9	side of neck
10	side of neck
11	plane
12	face
13	edge
14	top
15	end piece
16	centerline
17	string
18	aperture
19	rose
20	camber
21	unribbed area
22	first part
23	second part
24	region of edge
25	edge region
26	edge region
27	lath
28	mid-length axis
29	transverse rib
30	safety rib
31	hardwood piece

Lute

Claims

1. Lute having a bulging sound box tapering down to a virtual point and a neck attached to one side of the point comprising a fingerboard fretted and bearing a peg box at its free end, the sound box consisting of a vaulted back whose rim is everywhere curved outward on its way from one side of the neck to the other side and lying in a plane, and of a face whose edge is connected to the rim of the back, provided on its under side facing the back with laths and transverse ribs, provided on its top opposed to the under side with an end piece connected to the face in the third of a face centerline farthest removed from the neck along said centerline and in its lengthwise extent transverse to said centerline, several strings being stretched between the peg box and the end piece, and that in the half of the centerline nearest the neck one or more apertures are made between the upper and the under side, **characterized** in that the face (12) including the tailpiece (15) is vaulted outward, the greatest distance (20) of the vaulted face above the plane (11) being at least 2 mm, and in that on the under side of the face (12) an area (21) free from transverse ribs is provided, corresponding to a first part (22) more or less between the tailpiece (15) and the area (24) of the rim (13) and a second part (23) of about the same size bordering on the first part between the mutually opposed rim portions (25; 26), said area free from transverse ribs being at the same time configured as a lath-free area (21) or provided with laths (27) in centrally symmetrical arrangement.

2. Lute according to claim 1, characterized in that the laths (27) run substantially in the direction of the lengthwise extent of the centerline (16).

[redacted]

3. Lute according to claim 1 or 2, characterized in that the laths (27) run at an acute angle to the direction of the lengthwise extent of the centerline (16).

4. Lute according to any of claims 1 to 3, characterized in that the laths (27) run fan shaped in such manner that their mid-length axes (28) intersect at an imaginary point on the centerline (16) of the face (12) or its prolongation in the direction of the neck (4).

5. Lute according to either of claims 1 and 2, characterized in that the laths (27) run parallel to the centerline (16).

6. Lute according to any of claims 1 to 5, characterized in that an even number of laths (27) is provided.

7. Lute according to any of claims 1 to 5, characterized in that an odd number of laths (27) is provided.

8. Lute according to any of claims 1 to 6, characterized in that the thickness of the face (12) diminishes, at least in the region of the rib-free area (21), towards the rim (13).

9. Lute according to any of claims 1 to 7, characterized in that the ends of the transverse ribs (29) rest on abutments.

10. Lute according to any of claims 1 to 8, characterized in that at least two laths pass without contact beneath at least that transverse rib which lies closest to the rib-free area (21), where the transverse ribs comprise a tunnel-shaped recess together with said laths at the point of intersection.

11. Lute according to any of claims 1 to 9, characterized in that the fingerboard (5) is prolonged by a face segment on the face (12) and in that the arrangement of the frets is continued on the face segment.

12. Lute according to claim 10, characterized in that the face (12) is reinforced on its under side with a piece of hardwood (31) in the region of the face segment.

13. Lute according to any of claims 1 to 11, characterized in that eight strings (17) are strung, tuned C - D - E - A - d - g - h - e'.

14. Lute according to any of claims 1 to 11, characterized in that fifteen single strings are strung, tuned G - A - B - C - D - E - F - G - A - B - d - f - a -d' - f', or G - A - B - C - D - E - F - G - A - B - d - f - a - d' - g'.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
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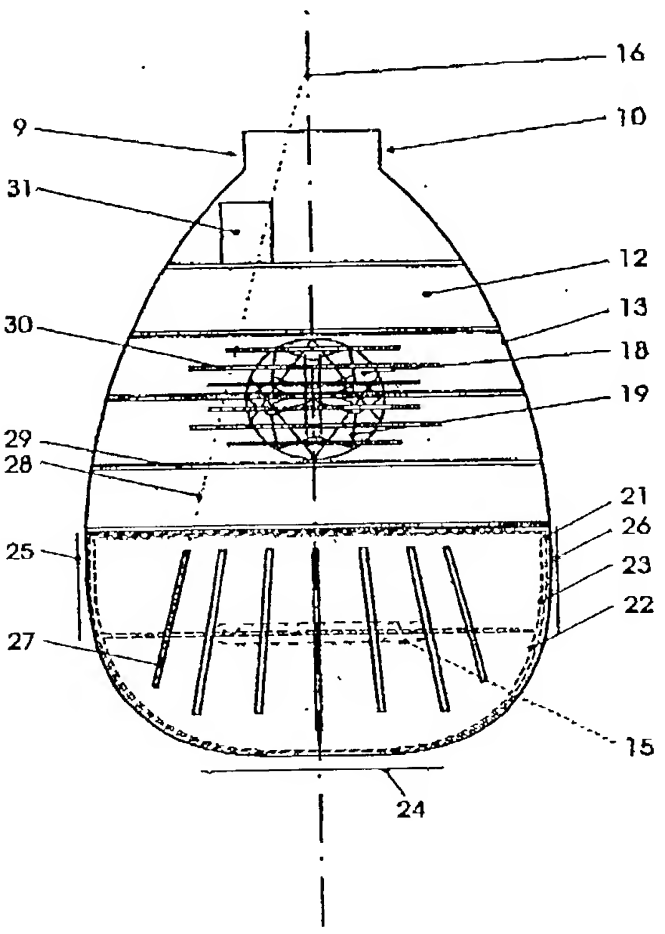
[Fortsetzung auf der nächsten Seite]

(54) Title: LUTE

(54) Bezeichnung: LAUTE



(57) Abstract: The invention relates to a lute comprising a body-shaped sound box and a neck attached thereto. The sound box is made up of a domed rear section and a cover. The aim of the invention is to provide a lute which can meet the needs of modern concert performances and be used by contemporary guitarists, whereby the excellent sound qualities of the lute are retained and the instrument can be used in a modern-day orchestra. This is achieved by providing the cover and the string-holder with a outwardly curved shape; a surface that is devoid of any transverse beams is arranged on the underside in an approximately symmetrical position with respect to the string holder and said surface is configured as a strip-free surface or fitted with strips which are symmetrical with respect to the center axis.

(57) Zusammenfassung: Der Erfindung, die eine Laute mit einem bauchigen Schallkörper und einem an den Schallkörper angesetzten Hals betrifft, wobei der Schallkörper aus einem gewölbten Lautenrücken und einer Decke besteht, liegt die Aufgabe zugrunde, die Laute so auszugestalten, dass sie modernen konzertanten Bedingungen gerecht wird und unter Beibehaltung seiner vorzüglichen Klangeigenschaften heutigen Gitarristen zugängig wird, um somit eine Reintegration der Laute in den heutigen Orchesterapparat zu ermöglichen. Dies wird dadurch gelöst, dass die Decke einschliesslich des Saitenhalters nach aussen gewölbt ist, dass auf der Unterseite eine querbalkenfreie Fläche, in etwa symmetrisch zu dem Saitenhalter angeordnet ist und dass die querbalkenfreie Fläche entweder als leistenfreie Fläche ausgebildet ist oder mit mittensymmetrischen Leisten versehen ist.

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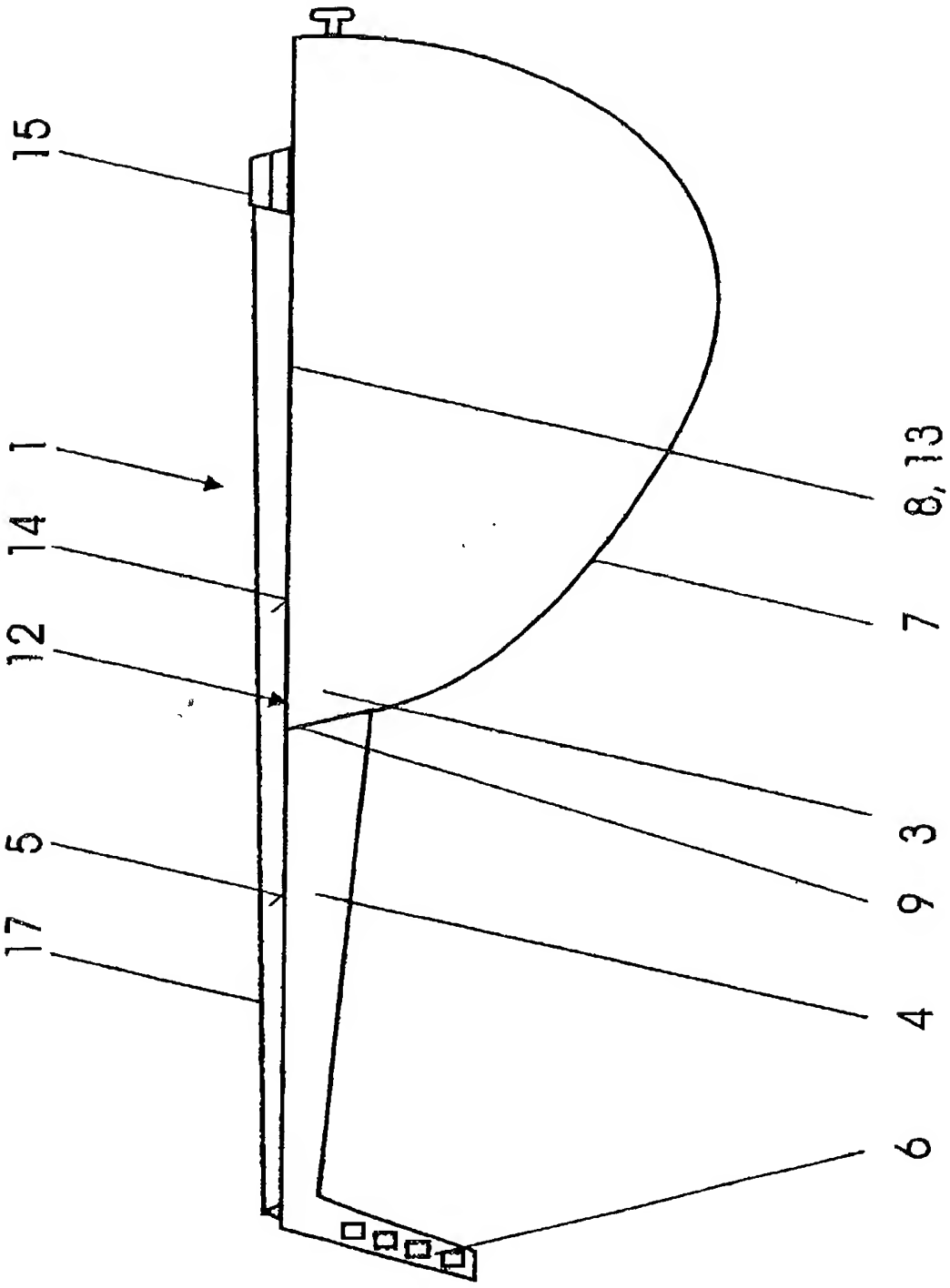
Fig. 1



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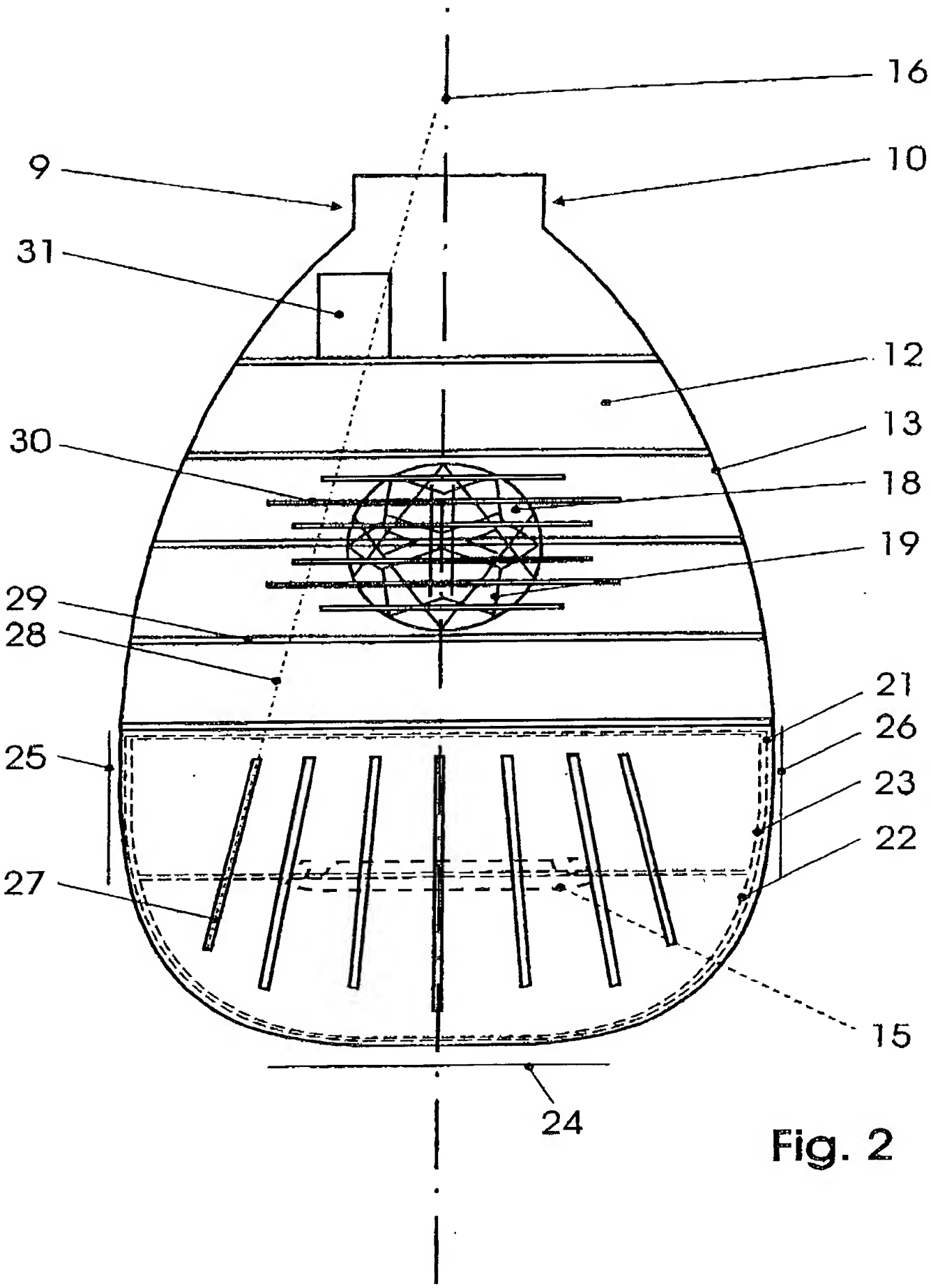
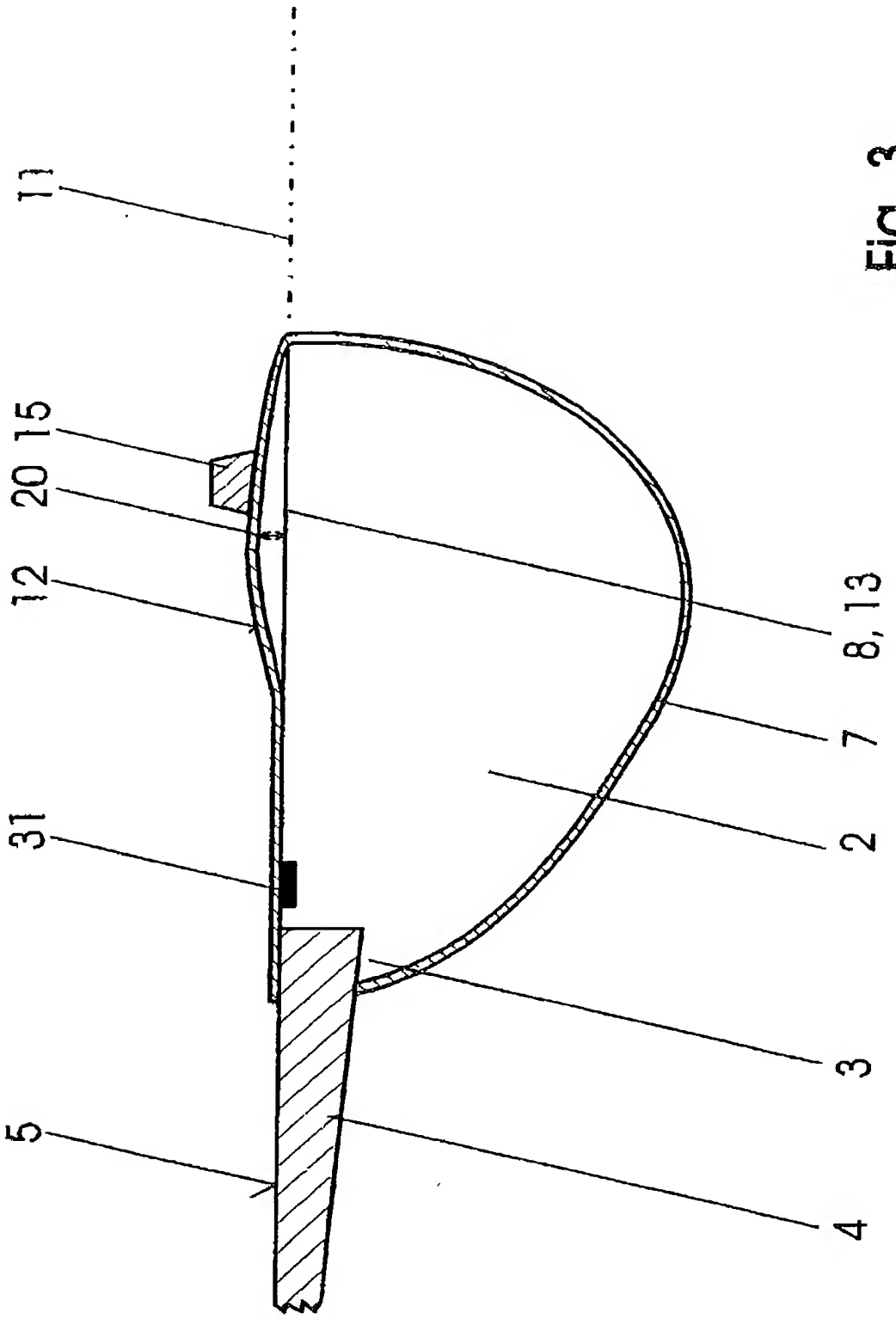


Fig. 2

Fig. 3



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Application Number	10/069,653
Filing Date	February 26, 2002
First Named Inventor	Burguete et al.
Group Art Unit	NOT YET ASSIGNED
Examiner Name	NOT YET ASSIGNED
Attorney Docket Number	A35040-PCT-USA-066340.0143

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☑ Applicant/Inventor.

☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

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Name	ANDRE BURGUETE
Signature	André Burguete
Date	7.6.2002

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Filing Date	February 26, 2002
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Attorney Docket Number	A35040-PCT-USA-066340.0143

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Examiner Name	NOT YET ASSIGNED
Attorney Docket Number	A35040-PCT-USA-066340.0143

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Date	16.6.2002

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)		
☐ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number	35040-PCT-USA-066340.0143
	First Named Inventor	Burguete et al.
	COMPLETE IF KNOWN	
	Application Number	10/069,653
	Filing Date	February 26, 2002
	Group Art Unit	NOT YET ASSIGNED
	Examiner Name	NOT YET ASSIGNED

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

LUTE

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☑ was filed on (MM/DD/YYYY) 02/26/2002 as United States Application Number or PCT International Application Number 10/069,653 and was amended on (MM/DD/YYYY) _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	Certified Copy Attached? NO
199 40 486.0	GERMAN	08/26/1999	☐	☐	☑
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

DECLARATION — Utility or Design Patent Application

Claim for Benefit of Prior U.S. Provisional Application(s)

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Provisional Application Number	Filing Date

Claim for Benefit of Earlier U.S./PCT Application(s) under 35 U.S.C. 120

(complete this part only if this is a divisional, continuation or C-I-P application)

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Application Number	Filing Date	Status (patented, pending, abandoned)

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Attorney Docket Number 35040-PCT-USA-066340.0143

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NAME OF SOLE OR FIRST INVENTOR : ☐ A petition has been filed for this unsigned inventor

1 - 00

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NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

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Inventor's Signature	Date

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☐ Additional Inventors are being named on the ____supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

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DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page ___ of ___

3-00

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor
Given Name (first and middle [if any])	Family Name or Surname
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Inventor's Signature X	**Date** 28.06.2002
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Mailing Address Else 47	
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Bad Rodach **City**	**State**	96476 **ZIP**	Germany **Country**

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor
Given Name (first and middle [if any])	Family Name or Surname
Inventor's Signature	**Date**
Residence: City	**State**	**Country**	**Citizenship**
Mailing Address	
Mailing Address	
City	**State**	**ZIP**	**Country**

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor
Given Name (first and middle [if any])	Family Name or Surname
Inventor's Signature	**Date**
Residence: City	**State**	**Country**	**Citizenship**
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BAKER BOTTS LLP

Attorney Docket Number 35040-PCT-USA-066340.0143

DECLARATION — Utility or Design Patent Application

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR : ☐ A petition has been filed for this unsigned inventor

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☐ Additional Inventors are being named on the ____supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.